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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

	Application No.	Applicant(s)
Office Action Summary	10/612,438	HU ET AL.
	Examiner	Art Unit	
	Shantell Portis	2617	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE _3_ MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on _18 April 2007_.

2a)☒ This action is **FINAL**.   2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) _1-29_ is/are pending in the application.

    4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) _1-29_ is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on _7/2/03_ is/are: a)☒ accepted or b)☐ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a)☐ All b)☐ Some * c)☐ None of:

      1.☐ Certified copies of the priority documents have been received.

      2.☐ Certified copies of the priority documents have been received in Application No. _____.

      3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1)☐ Notice of References Cited (PTO-892)

2)☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3)☐ Information Disclosure Statement(s) (PTO/SB/08)
    Paper No(s)/Mail Date _____.

4)☐ Interview Summary (PTO-413)
    Paper No(s)/Mail Date. _____ .

5)☐ Notice of Informal Patent Application

6)☐ Other: _____.

DETAILED ACTION

Response to Arguments

1.   Applicant's arguments filed on April 18, 2007 have been fully considered but they
are not persuasive. The applicant argues that Tiedemann includes absolutely no details
regarding iteratively determining values for the portions of the power and the number of
channelization codes to optimize a capacity of a channel for communicating the data
packets. The examiner respectfully disagrees. Tiedemann, Jr. et al. (Tiedemann, Jr.)
discloses a method and apparatus for maximizing the use of available capacity in a
communication system. Tiedemann, Jr. further discloses the CBR traffic streams 14a-c
and VBR traffic streams 14d-f are transmitted simultaneously on a common channel
within the time frames 18a-f. The values of power allocated and number of
channelization codes are determined based upon the first transmit power needed for
CBR and VBR traffic streams where as both CBR and VBR traffic (each traffic stream
transmitted is assigned to a code channel) take priority over ABR traffic. Once the base
station loads the forward link with CBR and VBR traffic in every time frame, it
determines which time frames have additional capacity available for transmitting ABR
traffic by comparing the power needed for transmission of the CBR and VBR during
each such frame with the maximum output power value. The ABR traffic streams use
all of the remaining available base station output power in order to take advantage of
the available transmit power which would otherwise remain unused thereby, maximizing
the use of available capacity in a communication system. Therefore, Tiedemann, Jr.
teaches a scheduling method for optimizing the capacity of a channel for

communicating. Tiedemann, Jr. discloses an iterative technique (scheduling method)
as described in paragraphs [0031]-[0035] and referencing figures 1 and 2 where this
method or technique is used repeatedly during communication. Further, Tiedemann, Jr.
discloses scheduling policies, rules for determining which of a plurality of signals waiting
to be transmitted are actually inserted into a frame, implemented within the method for
determining how best to schedule or transmit the ABR traffic streams in order to take
advantage of the available forward link transmit power that would otherwise remain
unused. See paragraphs [0005], [0007], [0031]-[0035], [0041], [0080] and [0081].

Therefore, the examiner maintains the rejections as set forth below.

Claim Rejections - 35 USC § 102

2.   The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that
form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a
foreign country or in public use or on sale in this country, more than one year
prior to the date of application for patent in the United States.

3.   Claims 1-12, 14, 16-24, 26 and 28 are rejected under 35 U.S.C. 102(b) as being
anticipated by Tiedemann, Jr. et al. (Tiedemann), U.S. Publication No. 2002/00304170.

Regarding Claims 1, 10, 16 and 28, Tiedemann discloses a method of
communication, comprising: assigning at least one channelization code to each of a
plurality of data packets **(inherent in a CDMA system; [0007])**; assigning portions of
power available for communicating to at least a subset of the channelization codes
based on a plurality of channel quality metrics **(power is assigned to CBR, VBR and**

ABR traffic based on power needed for transmission and priority relative to

quality of service; [0034]); and iteratively determining values for the portions of the

power and the number of channelization codes to optimize a capacity of a channel for

communicating the data packets.

Regarding Claims 2, 17 and 18, Tiedemann discloses further comprising:

determining the portions of the available power to be assigned based on the channel

quality metrics and a first optimization parameter **(the base station determines which**

time frames have additional capacity available for transmission by comparing

the power needed with the maximum output power value; [0034]); determining the

values of the number of channelization codes assigned to the data packets based on

the determined portions of the available power and a second optimization parameter

(determining the power required to transmit each ABR stream and selecting one

or more ABR streams with power requirements that are equal to the available

capacity; [0035]); and repeating the determining of the portions of the available power

and the determining of the values of the number of channelization codes.

Regarding Claim 3, Tiedemann discloses further comprising: determining the

number of channelization codes assigned to each data packet based on a size of the

data packet and one of the channel quality estimates associated with the data packet

(determining the power required to transmit each ABR stream and selecting one

or more ABR streams with power requirements that are equal to the available

capacity; [0035]); determining the portions of the available power to be assigned to

each of the channelization codes based on a first optimization parameter **(the base**

station determines which time frames have additional capacity available for

transmission by comparing the power needed with the maximum output power

value; [0034]); and repeating the determining of the number of channelization codes

and the determining of the portions of the available power.

Regarding Claims 4 and 19, Tiedemann discloses further comprising:

terminating the repeating responsive to the assigned channelization codes in a first

iteration being the same as the assigned channelization codes in a second later

iteration **(the assigned channelization codes are inherently the same for VBR**

traffic streams 14e, 14f and they both require little power during the time frame

18e; [0032]); and truncating the subset of assigned channelization codes based on a

maximum number of allowable channelization codes **(a subset of channelization**

codes are assigned specifically to each CBR, VBR and ABR traffic streams).

Regarding Claims 5 and 20, Tiedemann discloses wherein optimizing the

capacity further comprises optimizing a Shannon capacity **(inherent)** of the channel for

communicating the data packets **(see rejections for claim 2).**

Regarding Claims 6 and 21, Tiedemann discloses further comprising

prioritizing the plurality of data packets **(the scheduling of transmissions are based**

on priority and quality of service requirements; [0034] and see rejections for

claim 2).

Regarding Claims 7 and 22, Tiedemann discloses wherein prioritizing the

plurality of data packets further comprises: identifying a plurality of quality of service

classes **(CBR, VBR and ABR traffic streams; [0031-0033]);** assigning a

predetermined amount of the available power to each of the quality of service classes
(power is assigned to each traffic stream for each time frame 18a-f; [0032-0034]);
and assigning the channelization codes and the portions of the available power based
on the predetermined amounts for each quality of service classes **(power is first
assigned to CBR and VBR traffic streams and the remaining unused power is
used to schedule ABR transmissions; [0034] and [0035])**.

Regarding Claims 8 and 23, Tiedemann discloses wherein prioritizing the
plurality of data packets further comprises: identifying a plurality of quality of service
classes; assigning the channelization codes and the portions of the available power for
a first class **(CBR and VBR traffic streams)** of the quality of service classes;
determining a remaining amount of the available power after the assigning for the first
class; and assigning the channelization codes and the portions of the available power
for a second class **(ABR traffic streams)** of the quality of service classes based on the
remaining amount of available power **(see rejections for claim 7)**.

Regarding Claims 9 and 24, Tiedemann discloses wherein prioritizing the
plurality of data packets further comprises: identifying a plurality of quality of service
classes; combining all data packets in the plurality of quality of service classes; sorting
the combined users based on a fairness algorithm **(inherent when identifying a
plurality of quality of service classes)**; and assigning the channelization codes and
the portions of the available power based on the sorting **(power is assigned based on
availability and the quality of service classes) (see rejections for claim 7)**.

Regarding Claim 11, Tiedemann discloses further comprising initiating a communication link over a channel, the communication link being assigned to a quality of service class having a predetermined transmit power assignment and the power fraction is based on a portion of the predetermined transmit power **(the ABR traffic streams are assigned a predetermined transmit power based on the available remaining unused power; [0034] and [0035]).**

Regarding Claim 12, Tiedemann discloses wherein the channelization codes and the power fractions associated with the signal are assigned based on the channel quality estimate to optimize a Shannon capacity **(inherent)** of the channel **(see rejections for claims 10 and 11).**

Regarding Claims 14 and 26, Tiedemann discloses wherein the first constraint and first optimization parameter are associated with the power available for communicating, and the method further comprises determining the portions of the available power to be assigned based on the first optimization parameter **(see rejections for claim 7).**

Claim Rejections - 35 USC § 103

4.   The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

5.   Claims 13, 15, 25 and 27 are rejected under 35 U.S.C. 103(a) as being

unpatentable over Tiedemann.

Regarding Claims 13, 15, 25 and 27, Tiedemann discloses assigning at least

one of the channelization codes and the portions of power available for communicating

based on the first optimization parameter as described above.

Tiedemann fails to specifically disclose further comprising: generating a cost

function using a channel capacity equation having a first constraint, the cost function

including a first optimization parameter associated with the first constraint; and

determining a value for the first optimization parameter based on a first order derivative

of the cost function. However, according to Tiedemann **[0005]-[0007]** cost is

associated with each classification: CBR being the most expensive, VBR the next

expensive and ABR the least expensive. Based on this priority list the portions of

available power are assigned accordingly. At the time of the invention, it would have

been obvious to a person of ordinary skill in the art to determine the amount of power

required for transmitting each code channel based upon priority so as to not exceed

the total amount of power that the amplifier can provide without undesirable distortion

[0007].

Conclusion

6.   Applicant's amendment necessitated the new ground(s) of rejection presented in

this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP

§ 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37

CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE

MONTHS from the mailing date of this action. In the event a first reply is filed within

TWO MONTHS of the mailing date of this final action and the advisory action is not

mailed until after the end of the THREE-MONTH shortened statutory period, then the

shortened statutory period will expire on the date the advisory action is mailed, and any

extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of

the advisory action. In no event, however, will the statutory period for reply expire later

than SIX MONTHS from the date of this final action.

7.   The prior art made of record and not relied upon is considered pertinent to

applicant's disclosure.

Hill et al., U.S. Patent No. 6,775,256 discloses a packet scheduler and method

therefor.

Lundby et al., U.S. Patent No. 7,068,683 discloses a method and apparatus for

high rate packet data and low delay data transmissions.

Hsu, U.S. Publication No. 2004/0090938 discloses a method of optimizing

radiation pattern of smart antenna.

Ketchum, U.S. Patent No. 6,731,668 discloses a method and system for

increased bandwidth efficiency multiple input-multiple output channels.

Bombay et al., U.S. Patent No. 6,999,517 discloses a method and apparatus for

transmission of data on multiple propagation modes with far-end cross-talk

cancellation.

Gollamudi et al., U.S. Publication No. 2003/0123477 discloses an adaptive quality control loop for link rate adaptation in data packet communications.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Shantell Portis whose telephone number is 571-272-0886. The examiner can normally be reached on Monday-Friday 7:00am-3:30pm EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Lester Kincaid can be reached on 571-272-7922. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

SLP

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